MassDEP / LSPA Geothermal / GSHP Application Opportunities

Regulations for the Installation and Operation of Geothermal Heat Pump Wells

Joe Cerutti

MassDEP – Drinking Water Program

Abbreviations and Definitions

- UIC = Underground Injection Control
- GSHP = ground source heat pump = geothermal heat pump
- DX = direct exchange (ground portion of heat exchange occurs across a refrigerant loop)
- Dual use well = a well that is used as both a source of drinking water and heat pump supply
- Return flow = majority of the discharge from an open-loop heat pump
- Bleed flow = typically is 5% to 10% of the discharge from an open-loop heat pump that is not returned to the standing-column well
- gpd = gallons per day
- gpm = gallons per minute

Massachusetts Department of Environmental Protection (MassDEP)

MassDEP regulates geothermal heat pump wells, withdrawals, and discharges under the following programs:

- Underground Injection Control (UIC)
- Well Driller Certification
- Water Management Act
- Groundwater Discharge

US Environmental Protection Agency (EPA)

EPA regulates any geothermal discharges to jurisdictional surface water bodies:

- NPDES Non-Contact Cooling Water General Permit

History of UIC Requirements for Ground Source Heat Pump (GSHP) Wells

- May 1982 – MassDEP requires Underground Injection Control (UIC) registration of GSHP wells
- 1986 – EPA confirms state UIC programs' ability to regulate closed-loop (including DX) GSHP wells as Class V wells
- 2003 – MassDEP issues a GSHP fact sheet (posted on Well Driller Registration Program's web site)
- February 2009 – MassDEP adopts Guidelines for GSHP Wells
- February 2010 – elimination of registration fees and significant reduction in UIC application submittal requirements for closed-loop & DX wells
- December 2013– revisions to guidelines resolving state plumbing board issues with dual use wells

Wells Requiring UIC Registration

- Any well receiving return flow or system bleed from an open-loop system
- All closed-loop and Direct Exchange (DX) wells

Note: UIC registration is required for all of the above unless a Groundwater Discharge Permit (GDP) is required.

Wells Requiring Groundwater Discharge Permit

- Open-Loop if:
  - raw water exceeds primary drinking water Maximum Contaminant Levels (MCL) (some exceptions)
  - any chemical addition

Wells Prohibited in Massachusetts

- Open-Loop if:
  - drawing water from a Public Water System (other than make-up fluid)

Responsibilities

- Owner/Operator – properly operate and maintain system and notify UIC Program of changes to registration information
- Designer – MA PE or certified by International Ground Source Heat Pump Association (IGSHPA), Canadian Geoexchange Coalition (CGC), or the equipment manufacturer
- Installer – certified by IGSHPA, CGC, or manufacturer
- Well Driller –must be a Massachusetts Certified Well Driller

Setback Distances

If the open-loop well is also a private water supply well then all standard setback distances apply

- All others:
- 25 feet from potential sources of contamination including but not limited to:
  - septic tanks/fields
  - lagoons
  - livestock pens
  - oil or hazardous materials storage tanks
- 10 feet from property boundary (some towns require further setbacks from public road)
- 10 feet from potable water and sewer lines

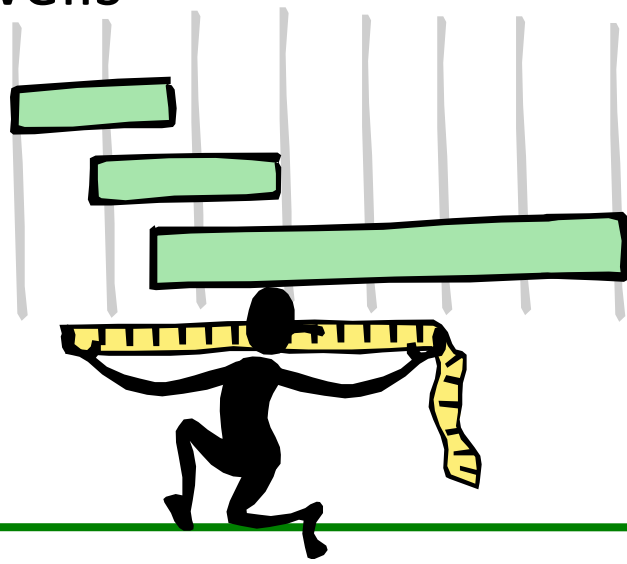
Setback Distances (continued)

Open-loop wells:

- 25 feet from private drinking water wells

Closed-loop and DX wells:

- 50 feet from private drinking water wells



Grouting Requirements

Open-loop wells should be installed per the standards established in the MassDEP Private Well Guidelines

- Bedrock Wells: casing set a minimum of 15 feet into competent bedrock and grouted in place
- Overburden Wells: grout seal across any confining layers and grout seal at or near ground surface

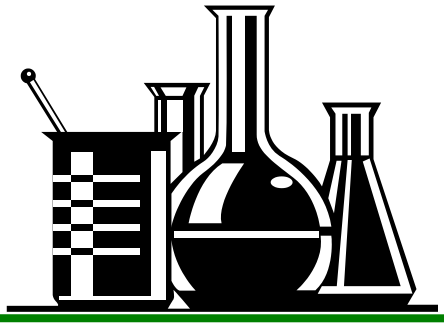
Grouting Requirements (continued)

- Closed-loop: Due to concerns associated with the expansion/contraction of plastic tubing (HDPE), high solids bentonite slurry grout required:
- DX: Same grouting requirements as closed-loop but a cement-based grout may be used in place of bentonite slurry grout

Note: sand/bentonite mixture grouts (thermal grouts) acceptable if cured grout's hydraulic conductivity does't exceed 10^{-7} centimeters per second

Allowable Additives

- Open-loop: no chemical additives currently allowed under UIC registration (permit required)
- Closed-loop:
  - Antifreeze additives: propylene glycol and ethanol
  - Ethanol denaturants: denatonium benzoate, ethyl acetate, isopropanol, pine oil, and tertiary butyl alcohol
- DX: R-22, R-407A, and R-410A refrigerants, food grade lubricating oils, and polyol ester



Other Requirements

- All GSHP wells: refrigerant leak detection and emergency shut-offs
  - For closed-loop these are required for leaks in both the water loop and the refrigerant loop
- Open-loop:
  - Discharge below the operating water level in the well
  - Backflow prevention device required on system bleed line
- DX: cathodic protection (some exceptions)

Other Requirements (continued)

- Dual use as a private drinking water well
  - Pump intake set below return line outlet in standing column wells
  - residential dual check backflow preventer prior to the heat pump
  - BOH approval for private drinking water well use
  - Requires local plumbing inspector approval
- Make-up water from public water system (PWS)
  - Approval from PWS
  - Backflow prevention device at PWS connection to building and 2nd device just prior to GSHP heat exchanger
  - MassDEP does't allow automatic feed systems

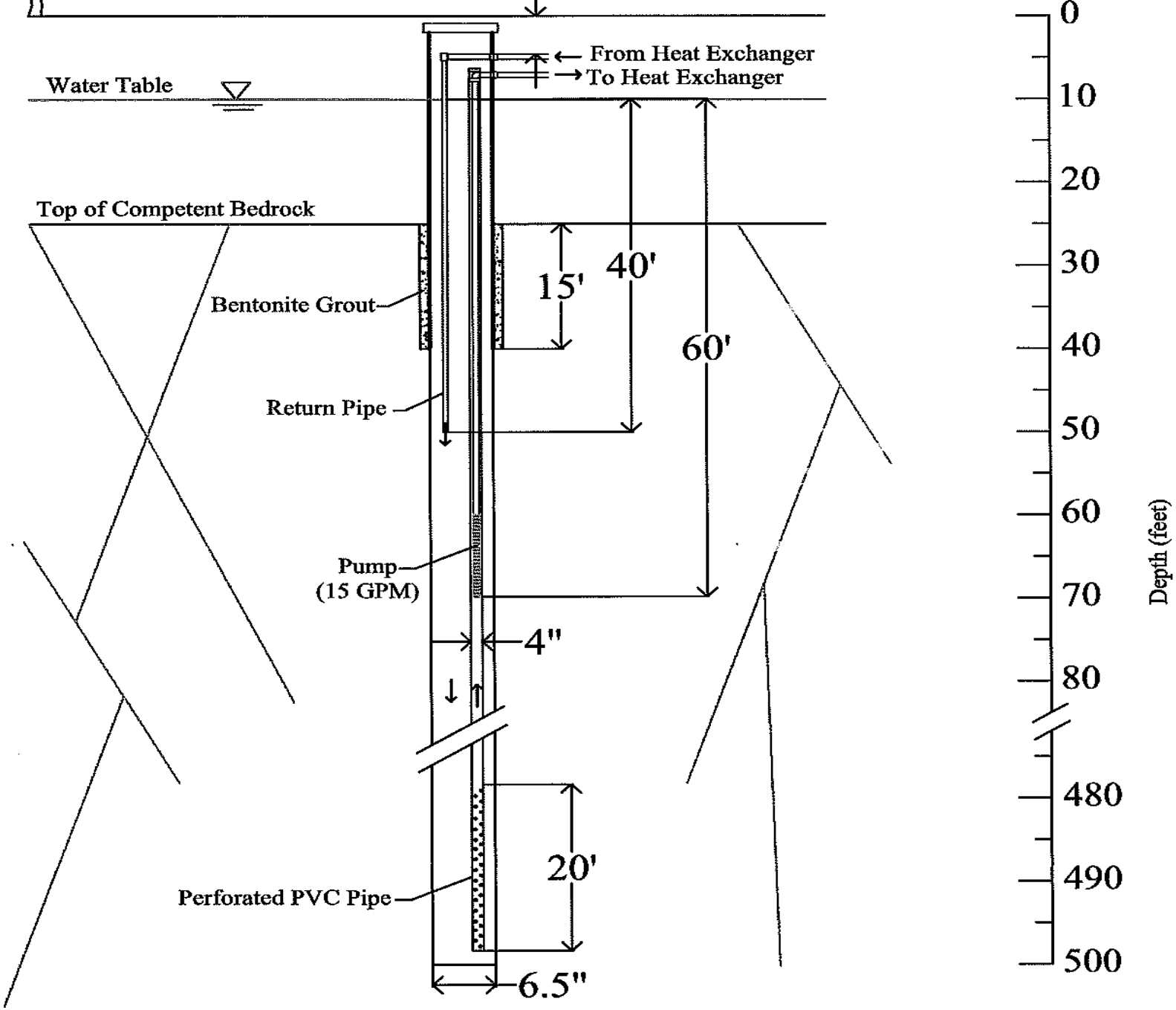
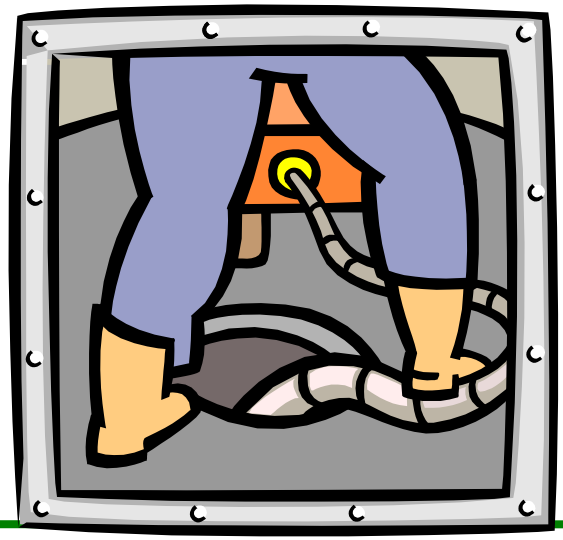


Figure copied from UIC submittal from GeoHydroCycle, Inc.

Other Requirements (continued)

- Local approval of bleed discharge to municipal sewer or stormwater (stormwater discharge may also require NPDES permit)
- Water Management Act Form I – determination of non-consumptive use required for system design rate >100,000 gpd (70 gpm)



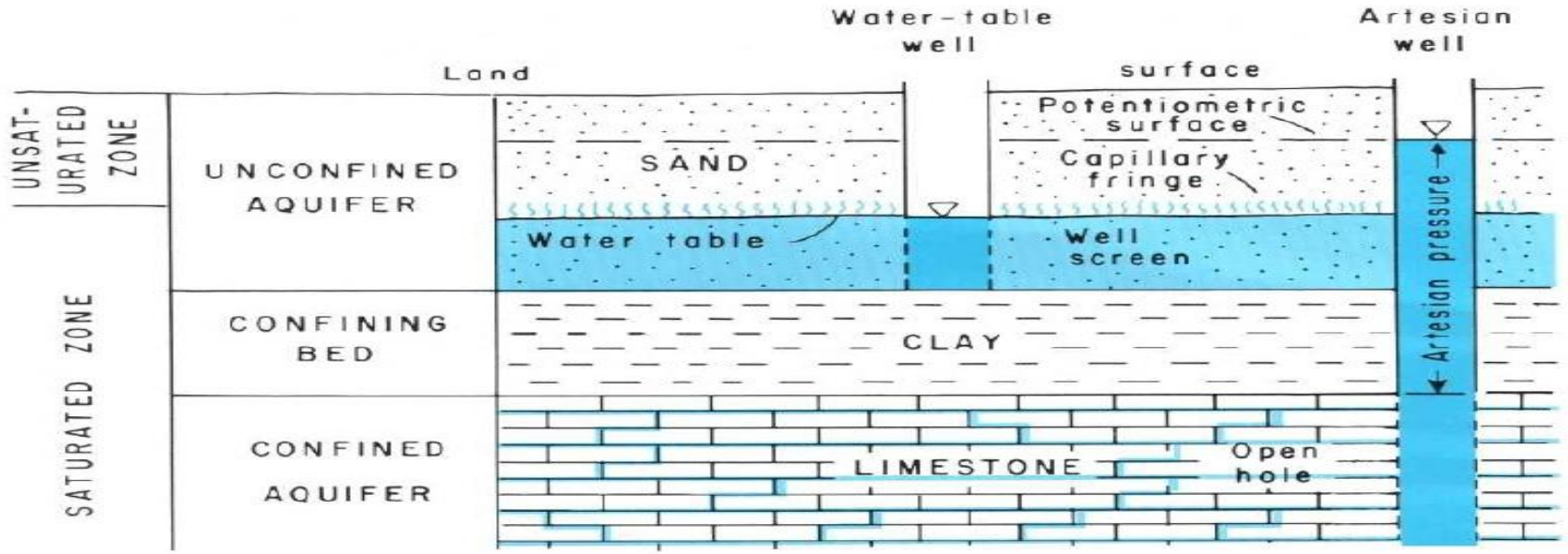
Other Requirements (continued)

- Construction Dewatering - must apply for approval (UIC registration or NPDES)
- Working within a wetland or surface water buffer (check with local Conservation Commission)
- Some BOH have adopted their own GSHP regulations and BOH drilling permit may be required for some or all GSHP well categories

Note: BOH may adopt stricter standards than MassDEP and BOH may exclude certain types of GSHP wells

Open-Transfer Well

- Open-Transfer Well: >5% of return and/or system bleed from a standing column well discharges to a different aquifer.
- These wells require the submittal of a justification statement with the UIC registration package.



Technologies Missing from Guidelines

Concentric Closed Loop

- Consists of an inner and outer well casing
  - Inner casing is essentially a drop tube open ended just above the bottom of the outer casing
- Use of experimental well casing and grout materials with better thermal conductivity values
- UIC Program treats similar to conventional closed-loop
  - Same set-back distance requirements
  - Same antifreeze solutions

Under Consideration for Future Well Driller Regulation Changes

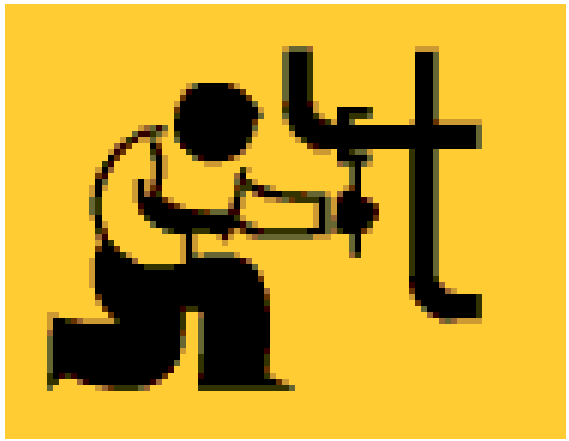
- Establish a special classification for well drillers that only install DX wells or conventional closed-loop wells

Lessons Learned Open-Loop Wells

- Unacceptable post heat pump lead and copper results
  - Water chemistry
  - Electrolysis resulting from insufficient grounding of the electrical system
  - Naturally occurring?

Lessons Learned
Open-Loop Wells (continued)

- Coastal Environments
  - Salt water intrusion and contamination of fresh water aquifers
  - Corrosion concerns for plumbing and heat pump equipment



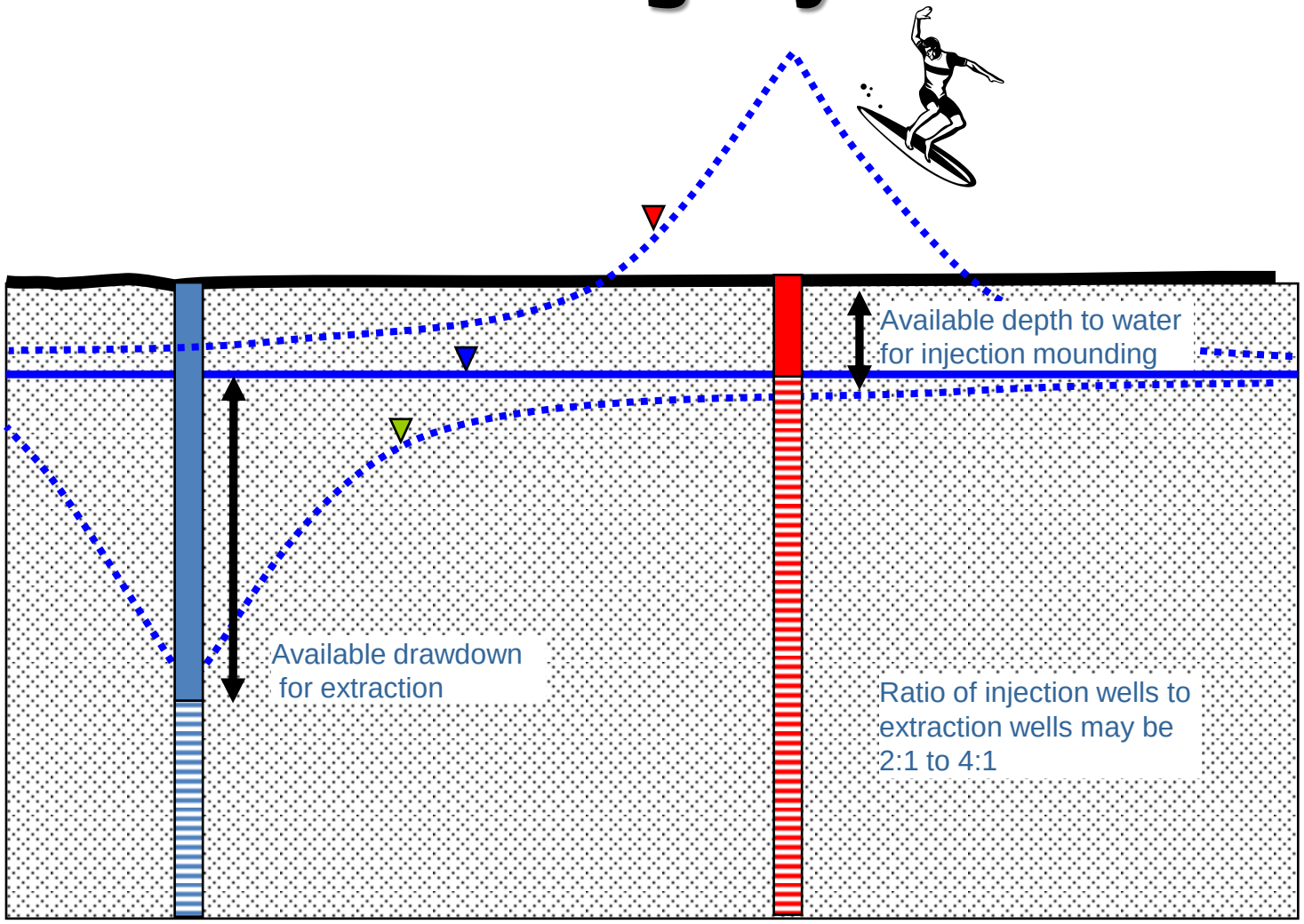
Lessons Learned
Open-Loop Wells (continued)

- Throughout Massachusetts
  - High Fe & Mn in raw water are common and can cause long term O & M costs
  - Low pH - corrosion concerns for plumbing and heat pump equipment
    - May result in failure of 90 to 120-day post start-up lead result

Lessons Learned
Open-Loop Wells (continued)

- Open doublet: pressurization of injection well
  - It's typically a lot easier to pump water from a well than it is to inject
  - 10 psi of pressure = 23 feet of water column
  - Consequences of pressurizing the injection well:
    - Break-out of ground water at ground surface resulting in flooding, erosion and the icing of walkways, roads, and driveways
    - Blow-outs or sink holes and the resulting concern for the structural integrity of nearby roads and building structures and damage to landscape features

Withdraw-Recharge Systems

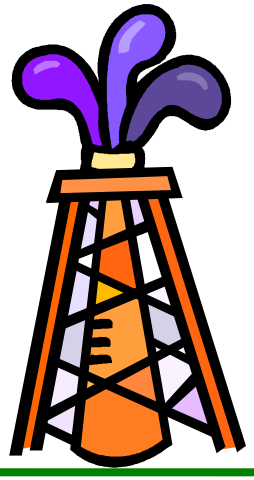


NOT TO SCALE

Original slide courtesy Haley & Aldrich, Inc.

Lessons Learned
Open-Loop Wells (continued)

- Open doublet (continued)
  - Will a 500 foot deep bedrock well with a shallow depth to water table that is capable of producing 20 gpm with 300 feet of drawdown accept an injection rate of 20 gpm without pressurizing the wellhead? Probably not.



Regional System Design Considerations

- Learn from your competitors:
  - No sand & gravel aquifer available = closed-loop & open-loop standing column bedrock well
  - Medium to high yielding sand & gravel aquifer available = closed-loop & shallow open doublet

Geothermal Wells at Waste Sites

- When UIC registration is required
  - Active sites: closed-loop: registration always required
  - Open-loop: not required if tapping into a required MCP pump & treat system but when site is RAO'd, then UIC registration is required.

Geothermal Wells at Waste Sites

- Site without RAO or geothermal well installed within AUL footprint
  - Requires statement from LSP of record indicating UIC well installation & discharge activities won't exacerbate existing conditions

Geothermal Wells at Waste Sites (continued)

- Potential for exacerbation of existing contaminant plume from open-loop wells
  - System bleed from bedrock well to a shallow overburden well
  - Mixing of water in bedrock fracture zones
  - System bleed to stormwater system
  - Open-loop - open transfer (open doublet) results in a greater impact on aquifer flow directions/velocities than a standing column well

Geothermal Wells at Waste Sites (continued)

- Water quality considerations
  - Drinking Water Program's MCL vs. MCP's RCGW-2 vs. NPDES limits
  - Groundwater Discharge Permit if pre-treatment required (only if treatment is not part of MCP cleanup activities)

UIC Registration Application Process

- Closed-loop and DX: *UIC Registration Application for Closed-Loop Ground Source Heat Pump Well*
- Open loop: *BRP WS 06 UIC Registration – Open-Loop Ground Source Heat Pump Well*
  - 1 to 4 unit residential use only properties - fee exempt
  - Closed-loop regardless of land use – fee exempt
  - All others – fee applies unless facility is municipally owned

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Drinking Water Program

UIC Registration Application for Closed-Loop Ground Source Heat Pump Well

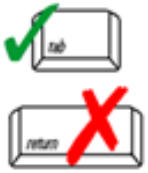
Registration Category

Registration of Underground Discharges to Injection Well(s) ☐
Modification to an Existing UIC Registration ☐

UIC Registration Fee - Exempt

For Modifications to an Existing UIC Registration

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Check all that apply: ☐ Change of owner ☐ Change in # of discharge wells (+/-)

Enter UIC Registration Number issued by MassDEP for the initial UIC Registration (required for modifications): _____ UIC Registration#

A. Site Information

_____
Property name (enter "Private Residence" if unnamed)

_____ _____
Property Street Address City/Town

_____ _____
State Zip Code

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – drinking water program

BRP WS 06 UIC Registration

Open-Loop Ground Source Heat Pump Well

Note: this application form only applies to Open-Loop Ground Source Heat Pump Wells.

Refer to the instructions and supporting materials document that corresponds to this UIC Registration form for detailed instructions regarding the completion of this form and the required attachments.

Transmittal # (not required for 1- to 4-unit residential applications)

A. Registration Category and Fee

Registration Category

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. Identify the type of registration activity you are conducting (check one):

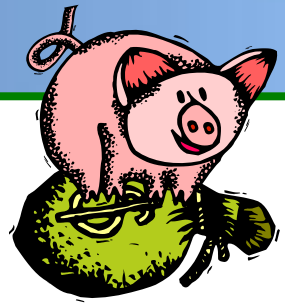
   a. Registration of a Proposed or Existing Unregistered UIC Well(s) ☐

   b. Pre-Closure of an Unregistered or Registered UIC Well(s) ☐

   c. Pre-Closure of an Unregistered or Registered UIC Well(s)and Conversion to New Well Type* ☐

   * **Note:** Conversion also requires submittal of a separate registration application for the new well type.

   d. Modification of a UIC Registration Application that is Still Under Review at MassDEP ☐



What is My Well Type & Application Fee for a BRP WS 06 Application?

five (5) or fewer wells with no well exceeding a well depth of 750 feet

- well type = 5C2 fee = $110

more than 5 wells, or one or more wells exceeding 750 feet in depth

- well type = 5C3 fee = $290

K. Additional Well-Type-Specific Information

Estimated total annual system bleed volume in gallons per year (does not typically apply to Well Type = “open doublet” or to normal consumption volume from a dual use well):

_____

System bleed discharge location (if not included in well construction information above):

☐ Stormwater ☐ Sanitary Sewer ☐ Surface Water ☐ Other (describe):

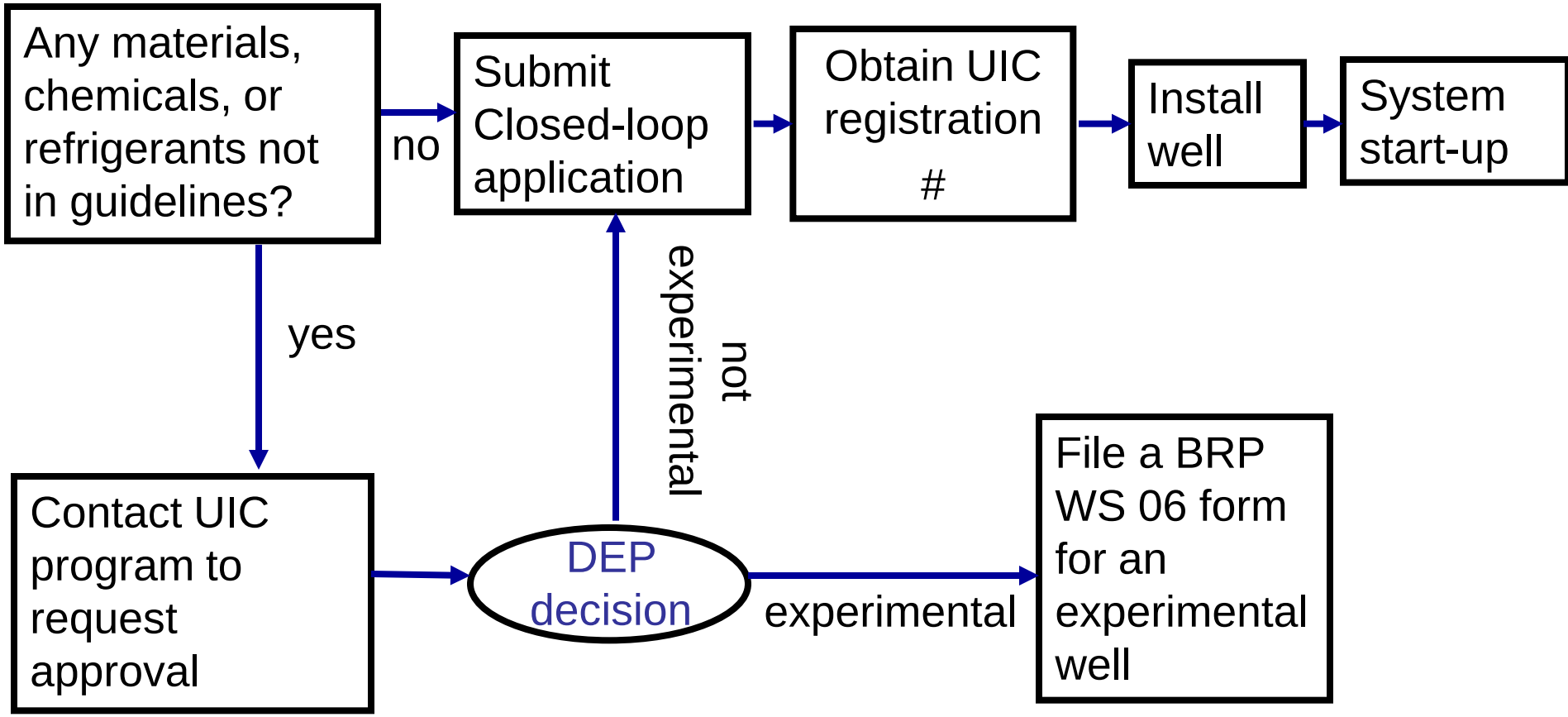
_____

Is this well(s) also being used as a water supply for other purpose(s)? ☐ Yes ☐ No

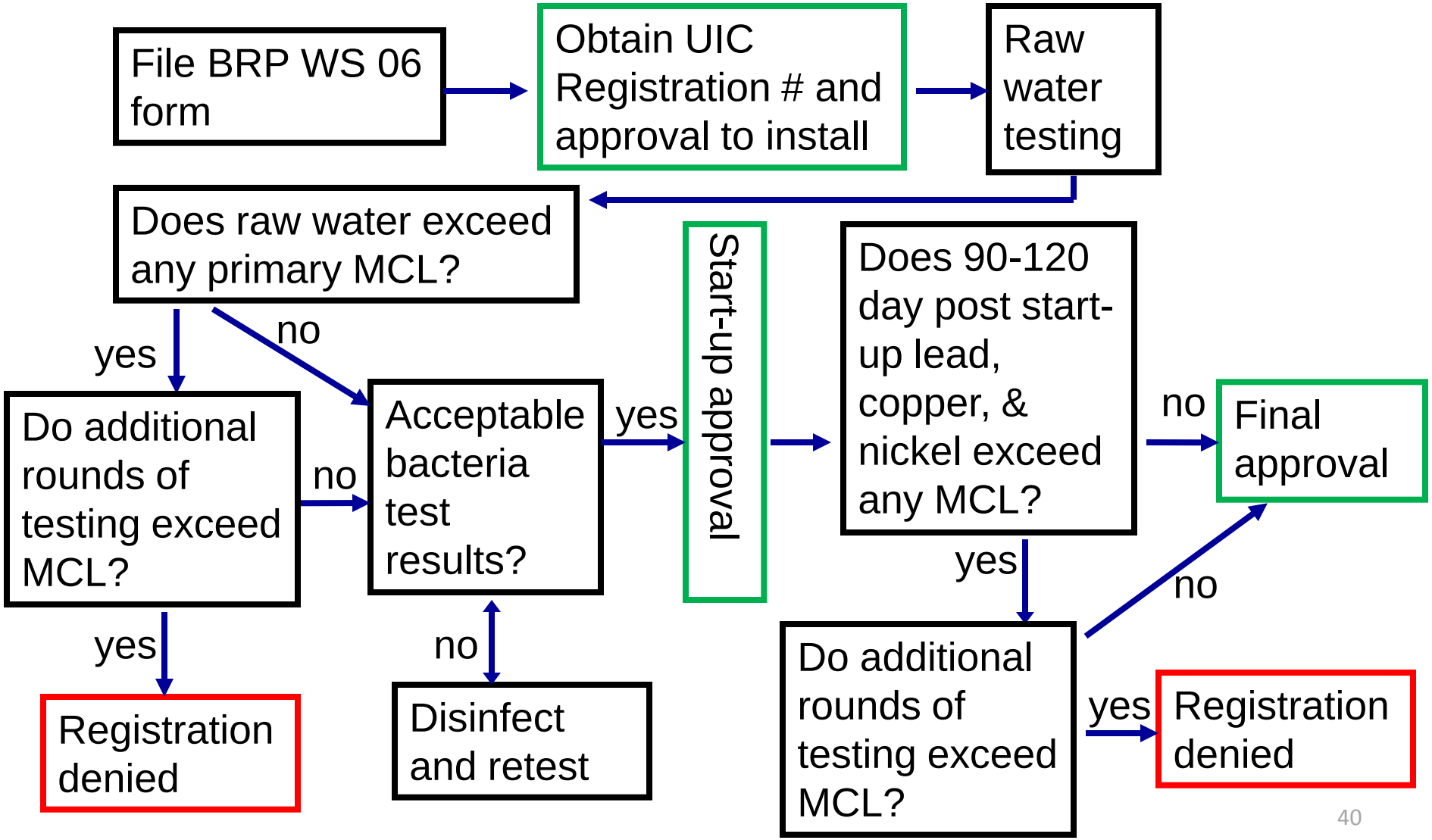
If yes, please indicate the other uses (check all that apply):

☐ Drinking Water ☐ Irrigation ☐ Process Water

UIC Application Process for Closed-Loop & DX Wells



UIC Application Process - Open-Loop Wells



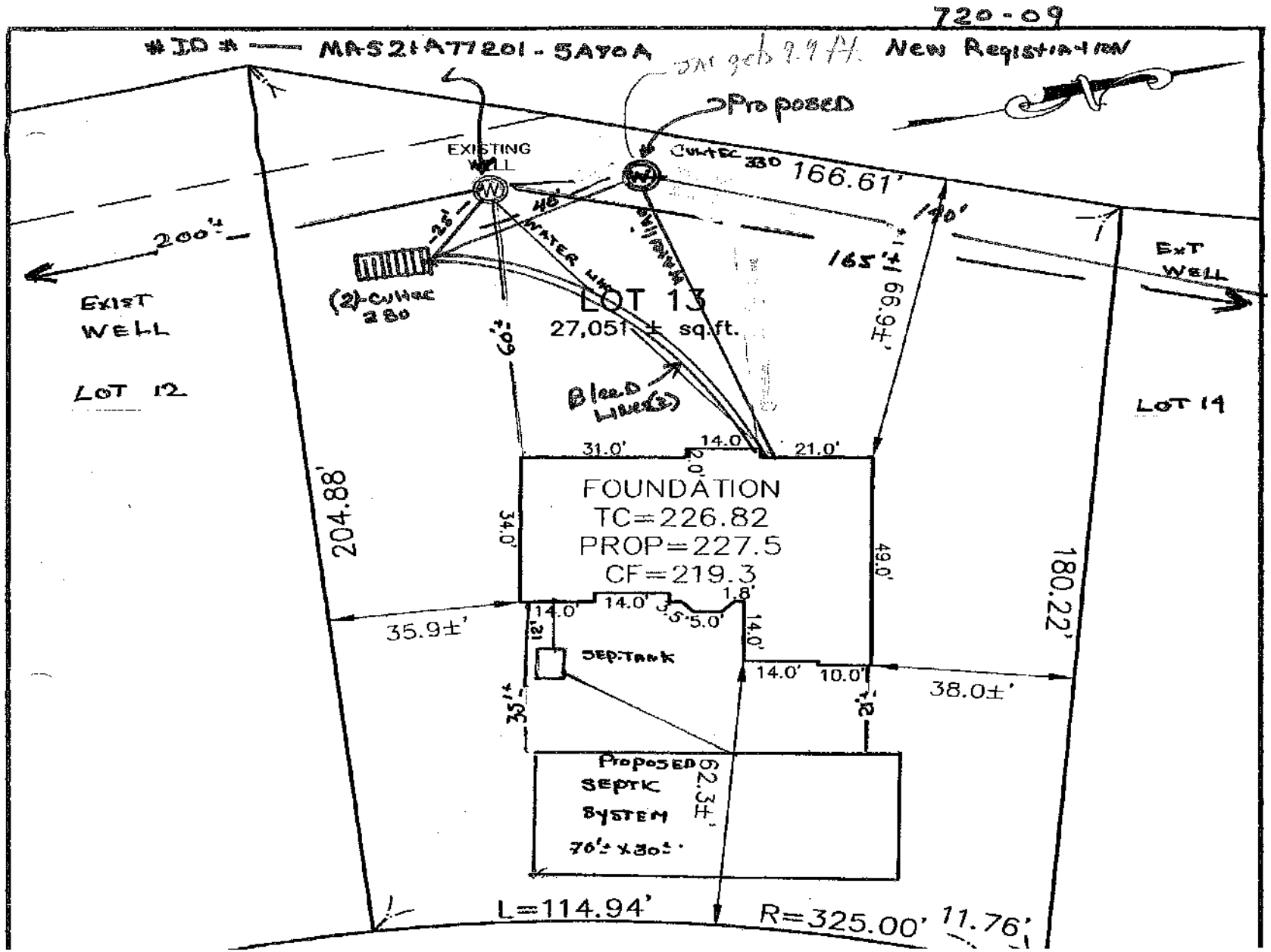
Open-Loop Application (continued)

- Site Plan
- Cross Section of GSHP well and bleed well (if applicable)

Open-Loop Application (continued)

Site Plan (Title 5 plans as base map are preferred) including:

- GSHP well location
- GSHP bleed well location (if applicable)
- Location of supply and return lines
- Footprints of building structures
- Location of septic tank and leach field
- Property boundaries
- Locations of any nearby drinking water wells (including abutting properties)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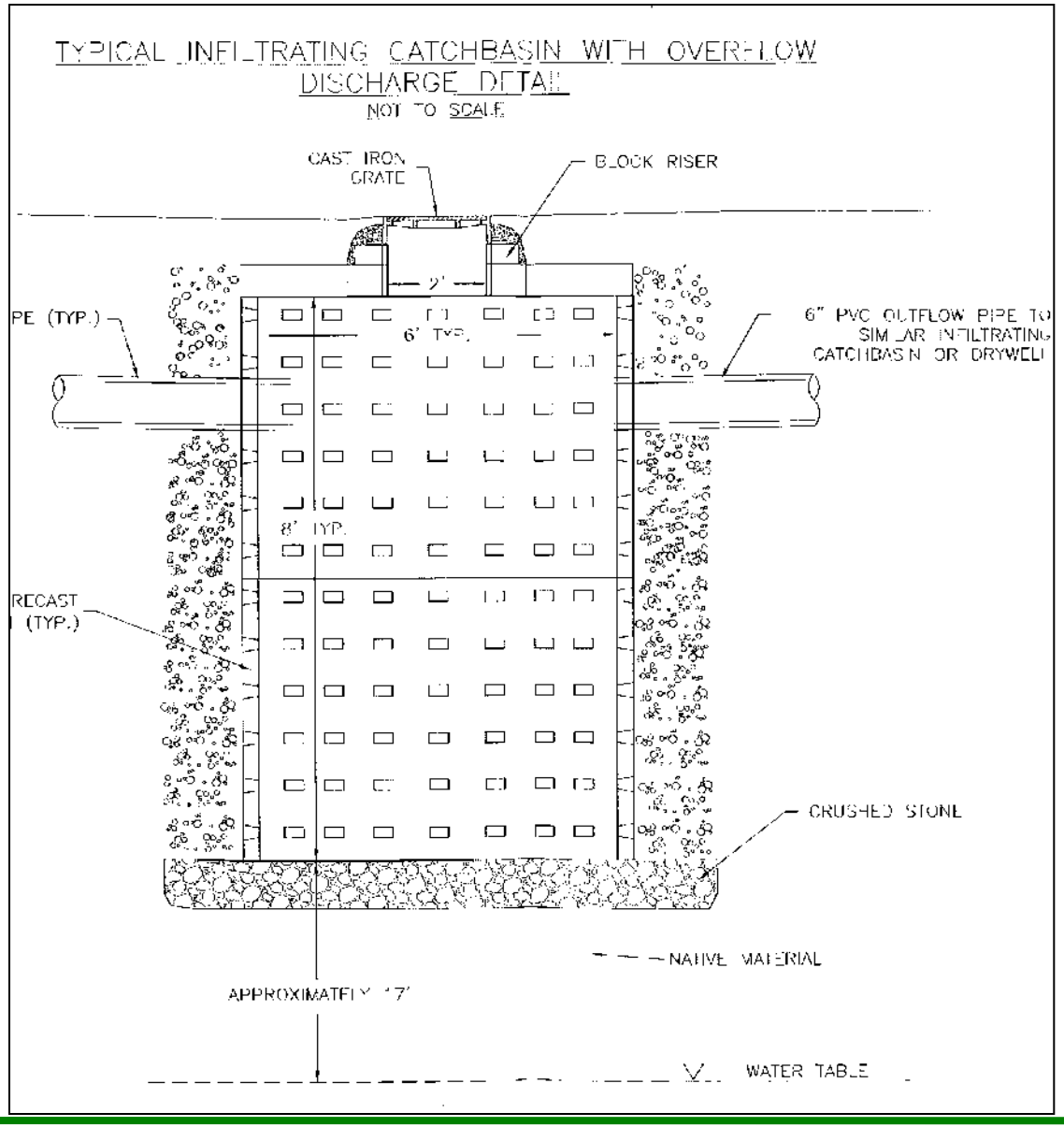
New Registration
Proposed
EXISTING WELL
Cultec 330
166.61'
200'±
EXIST WELL
LOT 12
(2)-Cultec 330
WATER LINE
ELECTRICAL
165'±
140'
EXT WELL
LOT 13
27,051± sq.ft.
Blend Line(s)
LOT 14
31.0'
14.0'
21.0'
FOUNDATION
TC=226.82
PROP=227.5
CF=219.3
204.88'
34.0'
49.0'
180.22'
35.9±'
14.0'
14.0'
1.8'
5.0'
14.0'
DEP:TANK
14.0'
10.0'
38.0±'
Proposed SEPTIC SYSTEM
70'± x 30'±
62.3±'
L=114.94'
R=325.00'
11.76'

Open-Loop Application (continued)

Cross section of proposed well construction including:

- Well depth
- Boring diameter
- Tubing diameter & material
- Grout interval
- Grout material
- Include cross section of bleed well (if applicable)


TYPICAL INFILTRATING CATCHBASIN WITH OVERFLOW DISCHARGE DETAIL
NOT TO SCALE
CAST IRON GRATE
BLOCK RISER
2'
6" PVC OUTFLOW PIPE TO SIMILAR INFILTRATING CATCHBASIN OR DRYWELL
PE (TYP.)
6' TYP.
8' TYP.
RECAST (TYP.)
CRUSHED STONE
NATIVE MATERIAL
APPROXIMATELY 17'
WATER TABLE

Open-Loop Application (continued)

Raw water analytical requirements:

- VOCs (EPA Method 524 + MTBE)
- arsenic
- nitrate (As N)
- nitrite (As N)
- gross alpha radiation
- radium (226 + 228)
- lead
- copper
- nickel
- uranium
- sodium
- chloride
- corrosivity
- iron
- manganese
- pH

Notes: Radiologicals not required in overburden wells on Cape, Islands, and Plymouth-Carver Aquifer (per August 2010 revisions)

Radium(226 +228) only required if gross alpha =/> 5 pCi/L

Uranium only required if gross alpha =/> 15 pCi/L

MassDEP raw water testing requirements typically exceed local BOH

Electronic Filing of UIC Registration Applications

- Electronic filing is available through eDEP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Business Sectors
Cleanup of Sites & Spills
Drinking Water
Service Centers
Toxics & Hazards
Underground Injection Control (UIC)
Waste & Recycling
Wastewater
Wetlands
All Forms
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Show Filter
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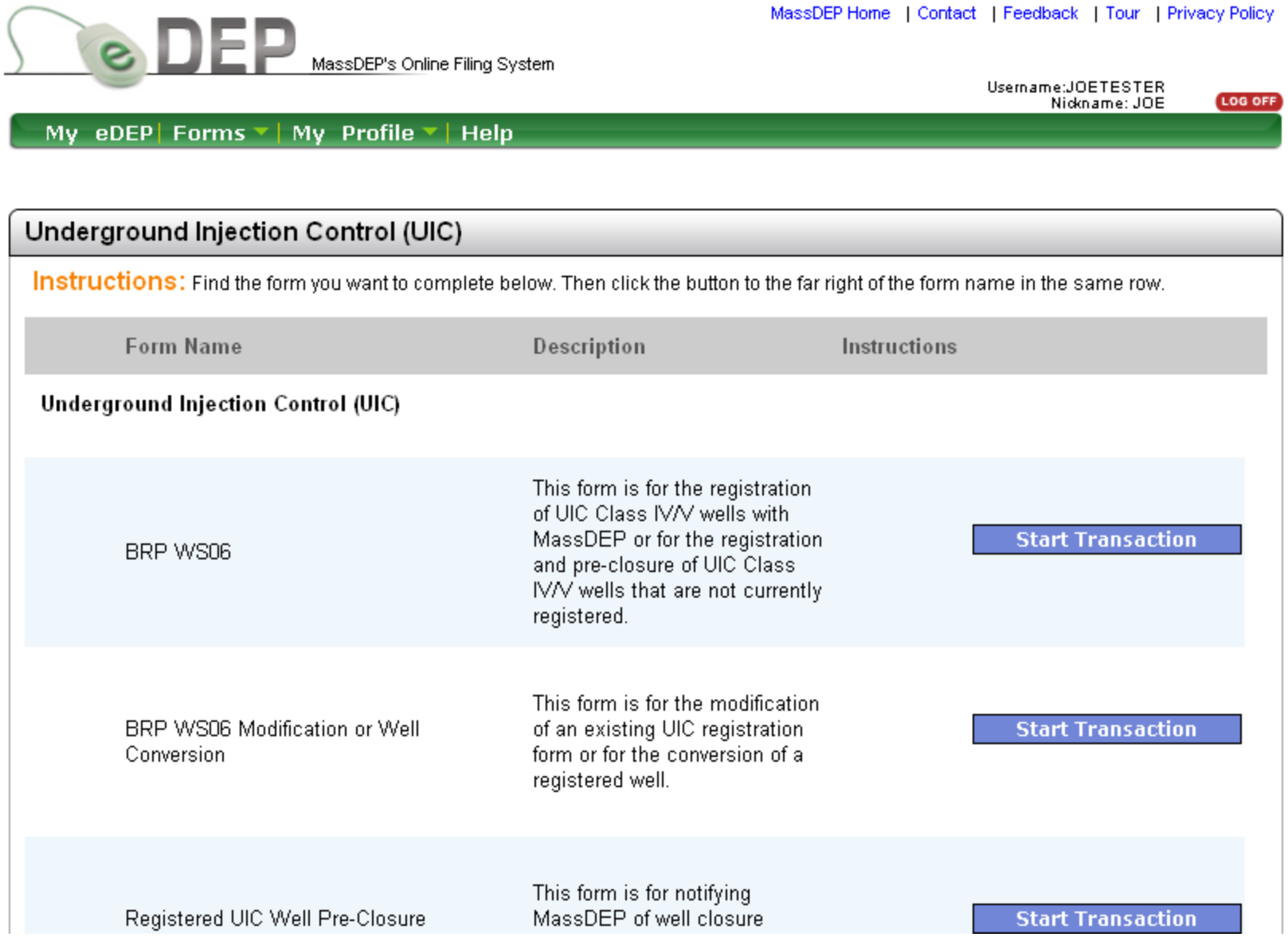
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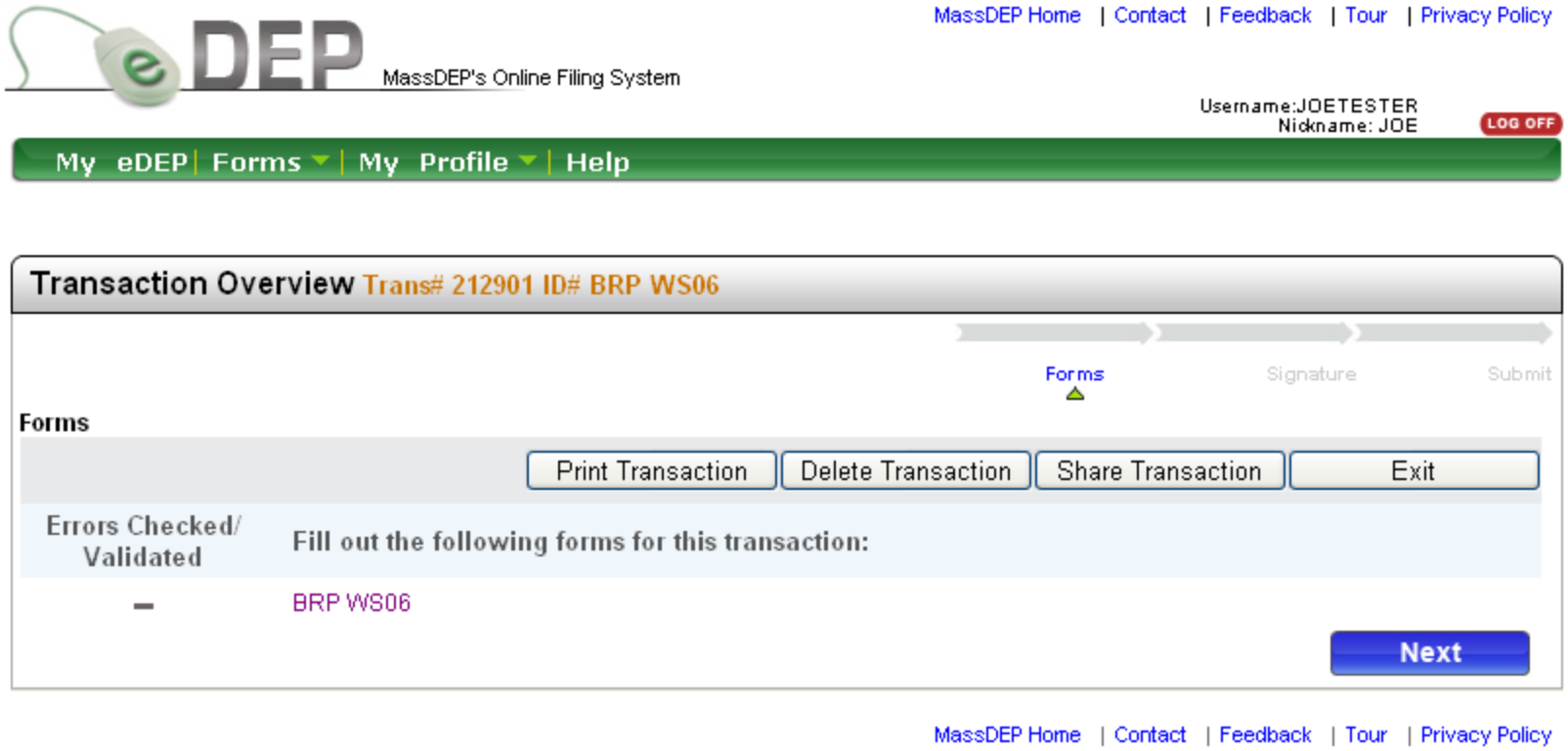
Underground Injection Control (UIC)
Instructions: Find the form you want to complete below. Then click the button to the far right of the form name in the same row.
Form Name
Description
Instructions
Underground Injection Control (UIC)
BRP WS06
This form is for the registration of UIC Class IV/V wells with MassDEP or for the registration and pre-closure of UIC Class IV/V wells that are not currently registered.
Start Transaction
BRP WS06 Modification or Well Conversion
This form is for the modification of an existing UIC registration form or for the conversion of a registered well.
Start Transaction
Registered UIC Well Pre-Closure
This form is for notifying MassDEP of well closure
Start Transaction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eDEP
MassDEP's Online Filing System
Username:JOETESTER
Nickname: JOE
LOG OFF
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Transaction Overview Trans# 212901 ID# BRP WS06
Forms
Signature
Submit
Forms
Print Transaction
Delete Transaction
Share Transaction
Exit
Errors Checked/ Validated
Fill out the following forms for this transaction:
–
BRP WS06
Next
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BRP WS06 - Transaction #212901

Error Check | Save | Print | Exit

Section 1
Section 2
Section 3
Section 4

BRP WS06 - Transaction #212901 - UIC Registration # N/A

A. General Question

You may only register one type of discharge (well type) per registration application even if you are registering one well for multiple types of discharges. If you are registering for more than one type of well discharge you should start another application form after completing this form.

A1. What well type do you wish to register at this time?

Well Category: Ground Source Heat Pump Well Type: open-loop - standing column

A2. Are there any well additives?

○ Yes ◉ No

A3. Is the design injection rate greater than or equal to 100,000 gpd?

◉ Yes ○ No

A4. Is the source of your injection water from a public water system?

○ Yes ◉ No

A5. Is the source of your injection water already registered/permitted with the Water Management Act Program (WMAP) or has it already received a determination of non-consumptive use from WMAP?

○ Yes ◉ No

A6. Does the well construction or closure activity involve a drilled well?

◉ Yes ○ No

A7. Is the registration a result of the closure or conversion activity of a previously unregistered well?

○ Yes ◉ No

A8. Is the facility serviced by the well for 4 residential units or fewer?

○ Yes ◉ No

H. Registered Well Driller (if applicable)

First Name | Last Name

Company Name | Phone # | Massachusetts Well Driller Registration #

Email

I. Site Information

Water Supply: ○ Public ○ Private Sewer: ○ Public ○ Private

Are there any other current or proposed discharges on site?

○ Yes ○ No

Check any of the following that apply to this site

a. ☐ Bureau of Waste Site Cleanup Priority Site If yes, File Number

b. ☐ Bureau of Waste Site Cleanup Waiver Site If yes, File Number

c. ☐ Superfund Site If yes, Federal ID #

If the site is currently being regulated by the Bureau of Waste Site Cleanup, check any of the following that apply

☐ Incident Response ☐ Short Term Measure ☐ Activity and use limitations

Confirm that the applicant has checked that the site does not have any activity restrictions with respect to limiting discharges on the site.

○ Restrictions ○ No Restrictions

Only enter the location of wells that will be used for the following well type: ***open-loop - standing column***

Location of Well, Latitude & Longitude are no longer optional data:

Add Row

Identify the method used for locating the latitude/longitude coordinates for the UIC Class V well(s):

a. Type

○ Approximate location of point of UIC Class V well(s)

I. Site Information

Water Supply: ○ Public ○ Private Sewer: ○ Public ○ Private

Are there any other current or proposed discharges on site?

○ Yes ○ No

Check any of the following that apply to this site

a. ☐ Bureau of Waste Site Cleanup Priority Site If yes, File Number

b. ☐ Bureau of Waste Site Cleanup Waiver Site If yes, File Number

c. ☐ Superfund Site If yes, Federal ID #

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Confirm that the applicant has checked that the site does not have any activity restrictions with respect to limiting discharges on the site.

○ Restrictions ○ No Restrictions

Only enter the location of wells that will be used for the following well type: ***open-loop - standing column***

Location of Well, Latitude & Longitude are no longer optional data:

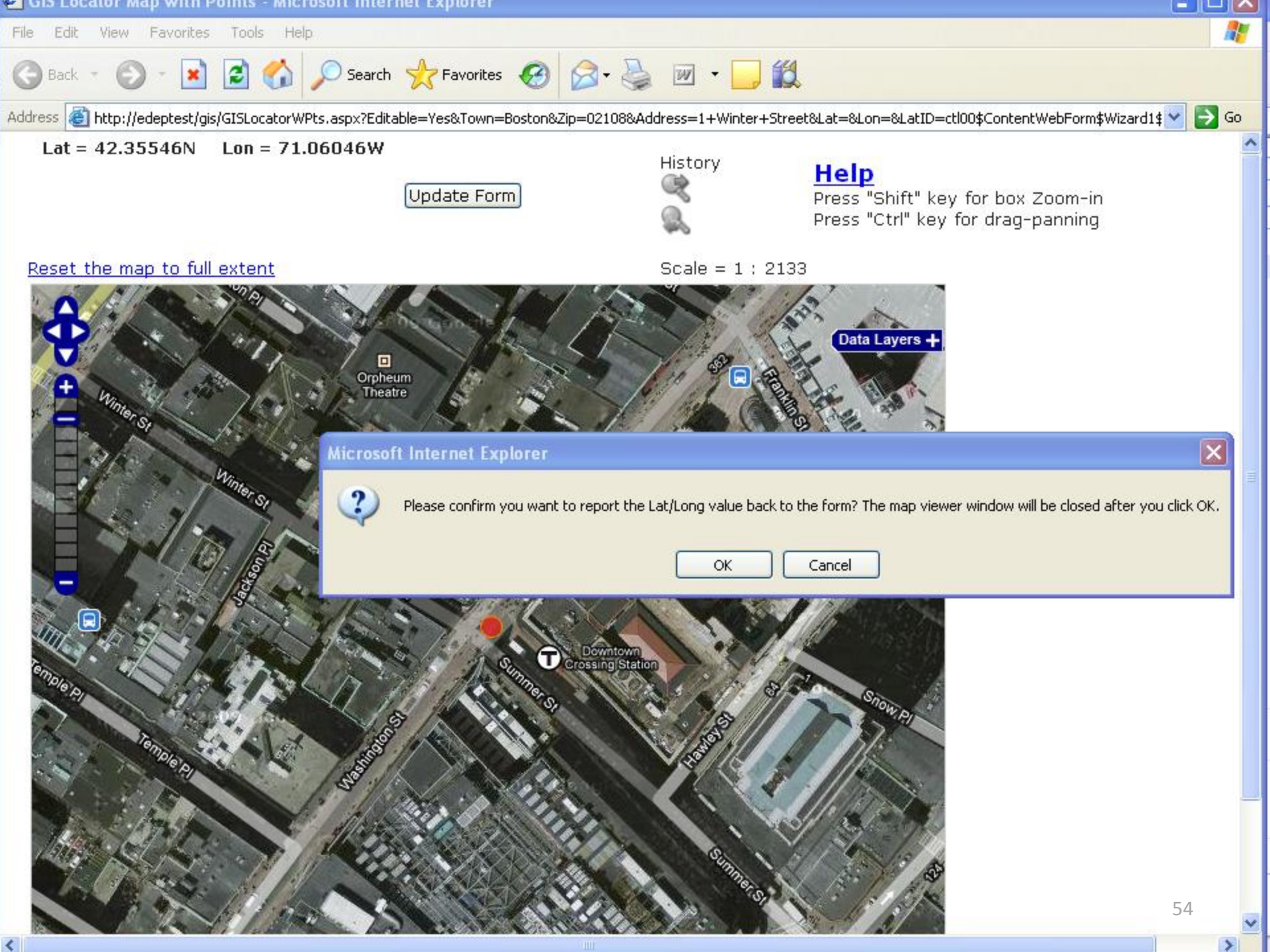
Well Identification Number	Latitude	Longitude	Locating Wells	
	N (e.g. 42.355767)	W (Do not enter (-) sign in front of value, e.g. 71.060996)	Locating Wells	Delete
			Add Row	

Identify the method used for locating the latitude/longitude coordinates for the UIC Class V well(s):

a. Type

○ Approximate location of point of UIC Class V well(s)

○ Approximate center of drainfield(s)


GIS Locator Map with Points - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
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Go
Lat = 42.35546N Lon = 71.06046W
Update Form
History
Help
Press "Shift" key for box Zoom-in
Press "Ctrl" key for drag-panning
Reset the map to full extent
Scale = 1 : 2133
Data Layers
Orpheum Theatre
Winter St
Winter St
Franklin St
Jackson Pl
Temple Pl
Temple Pl
Washington St
Summer St
Downtown Crossing Station
Hawley St
Snow Pl
Summer St
Microsoft Internet Explorer
Please confirm you want to report the Lat/Long value back to the form? The map viewer window will be closed after you click OK.
OK
Cancel

I. Site Information

Water Supply: ○ Public ○ Private Sewer: ○ Public ○ Private

Are there any other current or proposed discharges on site?

○ Yes ○ No

Check any of the following that apply to this site

a. ☐ Bureau of Waste Site Cleanup Priority Site _____ If yes, File Number

b. ☐ Bureau of Waste Site Cleanup Waiver Site _____ If yes, File Number

c. ☐ Superfund Site _____ If yes, Federal ID #

If the site is currently being regulated by the Bureau of Waste Site Cleanup, check any of the following that apply

☐ Incident Response ☐ Short Term Measure ☐ Activity and use limitations _____

Confirm that the applicant has checked that the site does not have any activity restrictions with respect to limiting discharges on the site.

○ Restrictions ○ No Restrictions

Only enter the location of wells that will be used for the following well type: ***open-loop - standing column***

Location of Well, Latitude & Longitude are no longer optional data:

Well Identification Number	Latitude	Longitude	Locating Wells	
Well #1	42.35546 N (e.g. 42.355767)	71.06046 W (Do not enter (-) sign in front of value, e.g. 71.060996)	Locating Wells	Delete
			Add Row	

Identify the method used for locating the latitude/longitude coordinates for the UIC Class V well(s):

a. Type

○ Approximate location of point of UIC Class V well(s)

○ Approximate center of drainfield(s)

○ Approximate location of center of wellfield(s)

MassDEP's Online Filing System

BRP WS06 - Transaction #640150

Error Check | Save | Print | Exit

Section 1
Section 2
Section 3
Section 4

BRP WS06 - Transaction #640150 - UIC Registration # N/A

J. Injection Well Information (include information for wells being registered for closure)

Well Category: ***Ground Source Heat Pump*** Well Types: ***open-loop - standing column***

Registration: ○ Individual ◉ Area (multiple wells with same well codes)

Number of Wells: 2 Maximum Well Depth (feet): 1,500

UIC Well(s) Construction Date (for existing wells):

Well Construction (check all that apply)

- ☑ Drywell
- ☑ Drilled Well
- ☐ Septic Tank
- ☐ Dug Well
- ☐ Improved Sinkhole
- ☐ Drainfield/Leachfield
- ☐ Trench Drain
- ☐ Dustwater onto the ground
- ☐ Horizontal (only applies to certain ground source heat pump wells)
- ☐ Other (describe)

Type of Well Seal (if applicable): CEMENT/BENTO Well Seal Grout Material:

Source of injection fluid and Potential contaminant

Add Injection Fluid

Maximum total rate of injection (gallons per minute): 100 Average discharge rate (gallons per day): 20,000

Number of entry points to existing system

1

Total Number of entry points for proposed system (include entry points for both new and existing wells)

1

Distance to nearest wetland or water body (feet);
enter N/A if distance is greater than 200 feet

N/A

Distance to nearest septic system (feet);
enter N/A if distance is greater than 200 feet

100

Distance to nearest building foundation (existing or proposed)(feet);
enter N/A if distance is greater than 25 feet

N/A

Distance to nearest property line (feet);
enter N/A if distance is greater than 25 feet

15

List any treatment devices, process equipment, or heat pumps in place or proposed prior to the injection point (attach specification sheets and include treatment devices in a cross section):

1 PLATE AND FRAME HEAT EXCHANGER

Depth to water table (feet)

Depth to bedrock (feet)

Soil type(s) at side - e.g., fill, sandy till, gravel, sand

Distance to nearest private drinking water well (existing or proposed) (feet);
enter N/A if distance is greater than 1,250 feet

Distance to nearest Public Water Supply (feet);
enter N/A if distance is greater than 2,500 feet

N/A

K. Additional Information Required for Specific Well Types

Estimated total annual system bleed volume in gallons per year (Does not include normal water consumption volume from a dual use well) 200,000

System bleed discharge location (if not included in well construction information above):

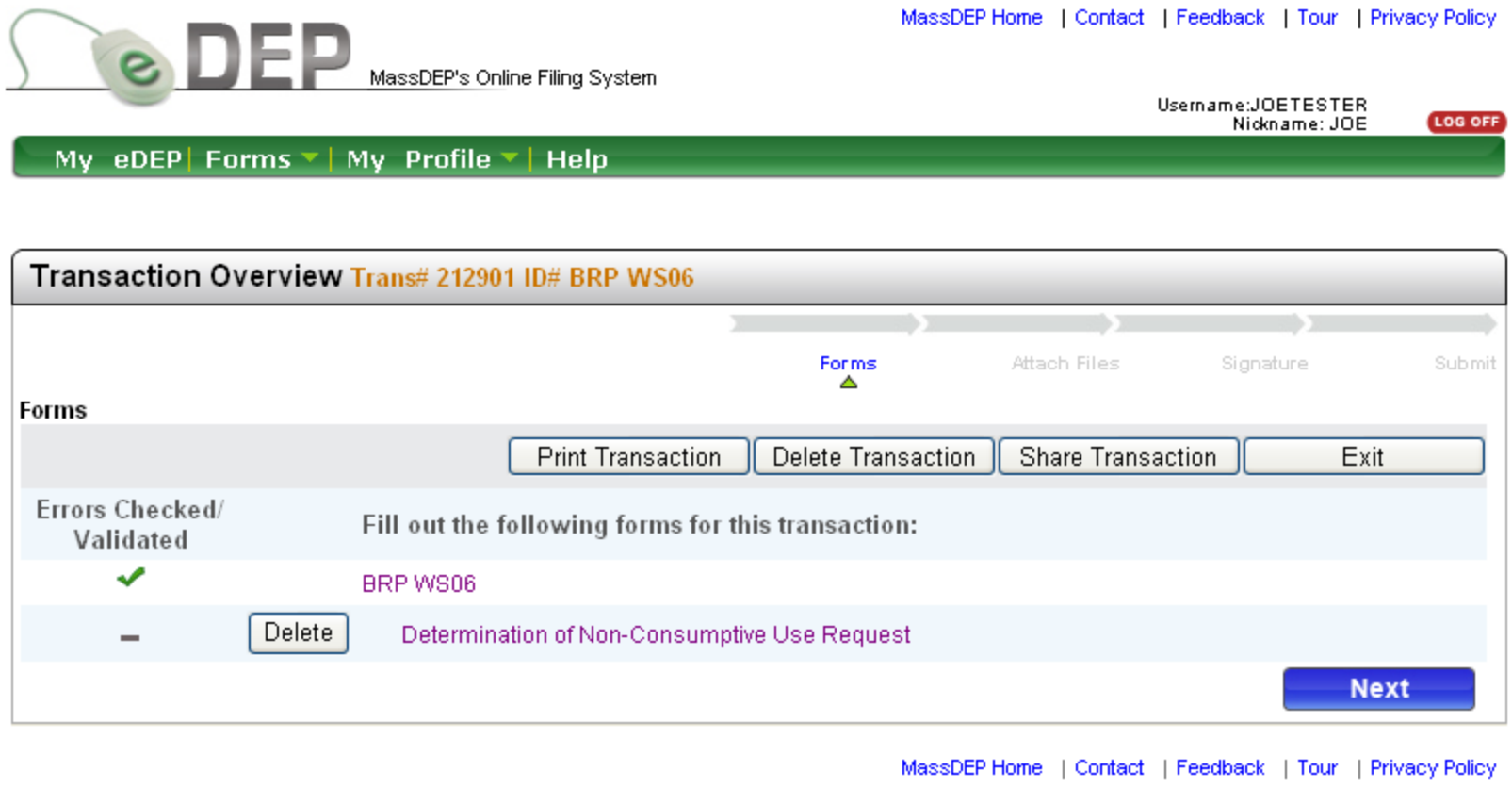
☐ Stormwater ☐ Sanitary Sewer ☐ Surface Water ☐ Other (describe)

Is this well(s) also being used as a water supply for other purposes?

◉ Yes ○ No

If yes, please indicate the other use(s) (check all that apply):

☐ Drinking Water ☐ Irrigation ☑ Process Water



MassDEP's Online Filing System

Determination of Non-Consumptive Use Request - Transaction #212901

Error Check | Save | Print | Exit

Determination of Non-Consumptive Use Request - Transaction #212901 - UIC Registration # N/A

A. Facility Information

Facility Name

Address

City/Town | State | Zip Code

Facility Contact Person:

First Name | Last Name

Email (optional)

B. Withdrawal Information

1. Design maximum daily withdrawal volume: 200,000 gallons per day

2. Existing or proposed maximum number of days per year of withdrawal (days of operation): 200 days per year

3. Existing or proposed average daily withdrawal volume (based upon number of days of operation per year): 25,000 gallons per day

4. Attach a copy of a USGS Quadrangle Map showing the location of the withdrawal point(s) (WP) and discharge point(s) (DP) and system bleed point(s) (BP) (if applicable).

5. Attach a schematic drawing indicating WP, DP and BP and distances between (in feet).

6. In the following table indicate the depth interval of the WP, DP, and BP and type of aquifer or surface water (i.e. sand & gravel, confined sand & gravel, bedrock, river, stream, lake, stormwater, shallow infiltration, etc.). Note: For a groundwater WP, DP, or BP, the depth interval should be the well screen interval (for confined and unconfined sand and gravel aquifers) or the interval of open borehole beneath the protective surface casing (for bedrock aquifers). If the WP and DP are in the same well and are open to the identical depth interval then enter "same" under the depth interval column for the DP location.

Location	Depth or depth interval of withdrawal or discharge (feet below ground or water surface)	Type of aquifer or surface water
WP	75 - 1,500	bedrock
DP	same	bedrock
BP (if applicable)	4 - 8	overburden

7. What is the proposed or existing use of this water?

standing column ground source heat pump

8. Is there an existing or planned system bleed point (BP) that is not the same location as the DP (Note: typical Title 5 or MassDEP permitted discharges of sanitary wastewater that may be generated from a dual purpose WP are not considered system bleed)?

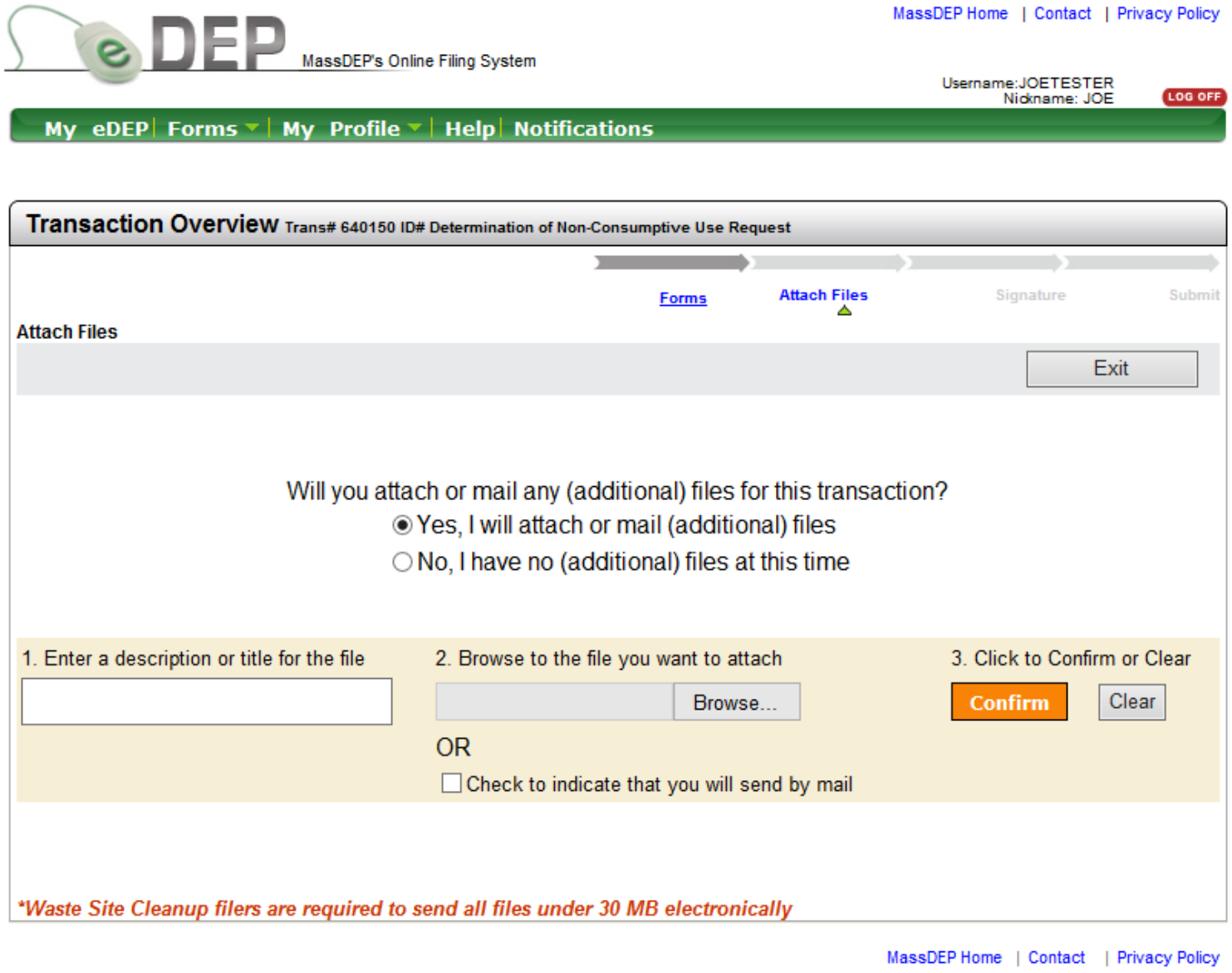
(•) Yes ( ) No

9. If there is an existing or proposed BP, answer the following questions:

a. Design maximum daily bleed volume: 5,000 gallons per day

b. Maximum number of days per year system will be bled: 25 days

10. Attach copy of laboratory reports on water quality test results (standard analyses) for WP and DP waters (temperature is a critical submittal).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Transaction Overview Trans# 640150 ID# Determination of Non-Consumptive Use Request
Forms
Attach Files
Signature
Submit
Attach Files
Exit
Will you attach or mail any (additional) files for this transaction?
Yes, I will attach or mail (additional) files
No, I have no (additional) files at this time
1. Enter a description or title for the file
2. Browse to the file you want to attach
Browse...
OR
Check to indicate that you will send by mail
3. Click to Confirm or Clear
Confirm
Clear
*Waste Site Cleanup filers are required to send all files under 30 MB electronically
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Transaction Overview Trans# 212901 ID# Determination of Non-Consumptive Use Request
Forms
Attach Files
Signature
Payment
Submit
Forms
Print Transaction
Delete Transaction
Share Transaction
Exit
Errors Checked/ Validated
Fill out the following forms for this transaction:
BRP WS06
Determination of Non-Consumptive Use Request
Next
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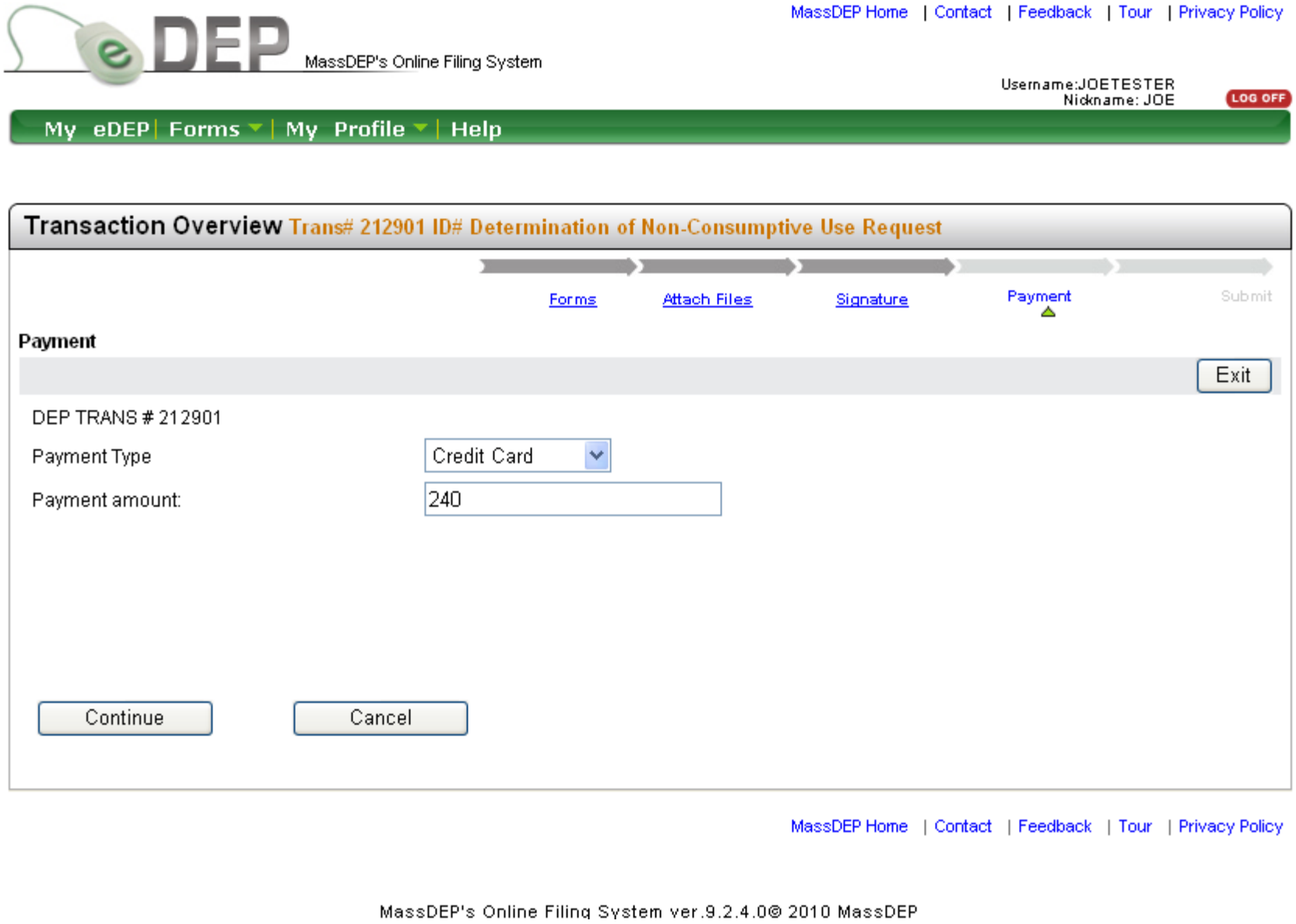
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Transaction Overview Trans# 212901 ID# Determination of Non-Consumptive Use Request
Forms
Attach Files
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Payment
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Payment
Exit
DEP TRANS # 212901
Payment Type
Credit Card
Payment amount:
240
Continue
Cancel
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MassDEP UIC Information & Contact

Guidelines for Ground Source Heat Pump Wells & UIC forms and instructions available on MassDEP's UIC Web page:

http://www.mass.gov/eea/agencies/massdep/water/drinking/underground-injection-control.html

For GSHP UIC Registration:

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